INTRODUCTION TO Laser Engraving

USING THE WLPL GLOWFORGE

The machine you'll be using!

Meet the **Glowforge!** Ours is a Glowforge Pro, which means its got some cool features - in particular the pass through option for larger cutting and engraving projects!

Getting Familiar with the Glowforge

One of the best things about the Glowforge is how user-friendly it is! You'll notice it has only one button - that's because all of the prep work happens in the Glowforge app, a browser-based workspace where you adjust your settings and tweak your image.

The other features of the machine itself are the removable debris tray that sits in the bottom, the trap door in the front of the machine that makes it easier to load and unload large materials and the passthrough slots in the front and back so that you can easily slide a long section of material through for massive prints!

We keep our Glowforge neat and clean, which means cleaning the glass, laser tube and all of the lenses inside with special products as well as emptying the debris tray every few prints. We are also very careful to only run the Glowforge with its special air filter operating - the air filter enables us to use the Glowforge anywhere in the building without needing to vent it out a window.

If you have any questions about how the Glowforge operates, don't hesitate to ask!

The file you'll need!

Conveniently, you can create an engravable file out of many sorts of images as long as the lines are clear. So for instance, a photo wouldn't work as well as a black and white silhouette image. But the Glowforge can engrave, score or cut images, text and repeating designs with ease!

The suggested file type is an **SVG**. This is because an SVG can be scaled without losing quality and within one SVG file, you can instruct the Glowforge which shapes to engrave, which to score, and where to cut.

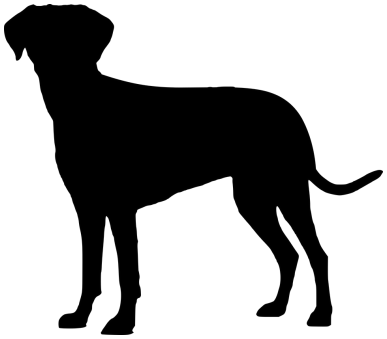
You can find SVG cut files online in some places. Many designers will sell their creations on sites like etsy, though you can occasionally find them for free on sites like Thingiverse.com - it just takes knowing good search terms for what you'd like.

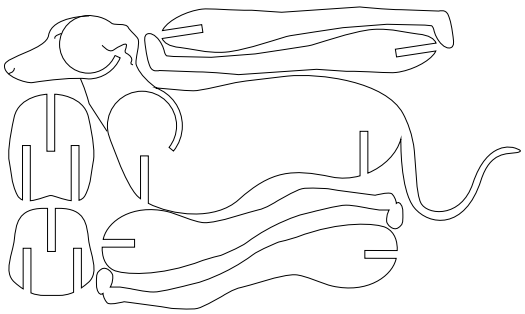
Try something like "laser cut design" to see what comes up before searching something more specific like "dogs" as Thingiverse has mostly 3D print designs and you will have to dig through a lot of results before you find something that will work with the Glowforge.

silhouette

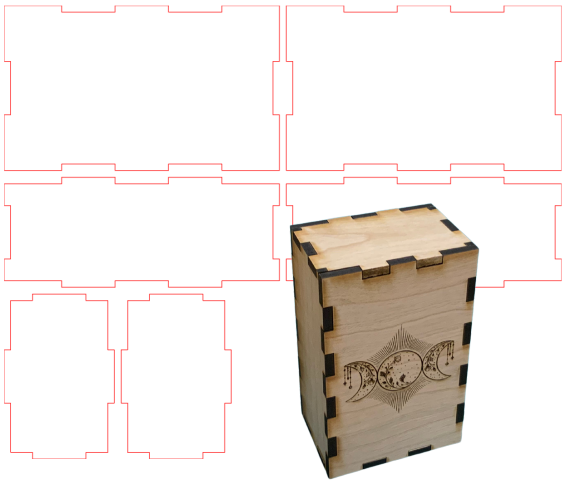
But for an easy starter project, you can use the program Silhouette Studio to create an SVG file. The file you start with can be pretty much anything! The clearer the outlines, the better.

Here are some good examples of what you might want to look for in an image:





A file might look like this to create a piece you can assemble into a 3D object!



A Word on Materials

Our Glowforge is a pretty capable machine and can cut / engrave a number of materials, but there are limitations and some materials are trickier than others.

The best bet for most engraving or cutting projects is going to be plywood (or draftboard) or acrylic sheets. The Glowforge's laser can very easily cut materials 5 mm and under. Anything over that thickness might require a few passes to cut it properly and the laser might have issues focusing on the surface.

Here is a quick guide to materials you might find success with when using the Glowforge as well as some that are hazardous to use:

- 3mm plywood
- 3mm acrylic sheet
- cardboard
- coated metal
- glass (with some limitations)
- vegetable tanned leather

- most uncoated metals
- PVC
- ABS
- fiberglass
- foam / Styrofoam
- chrome tanned leather

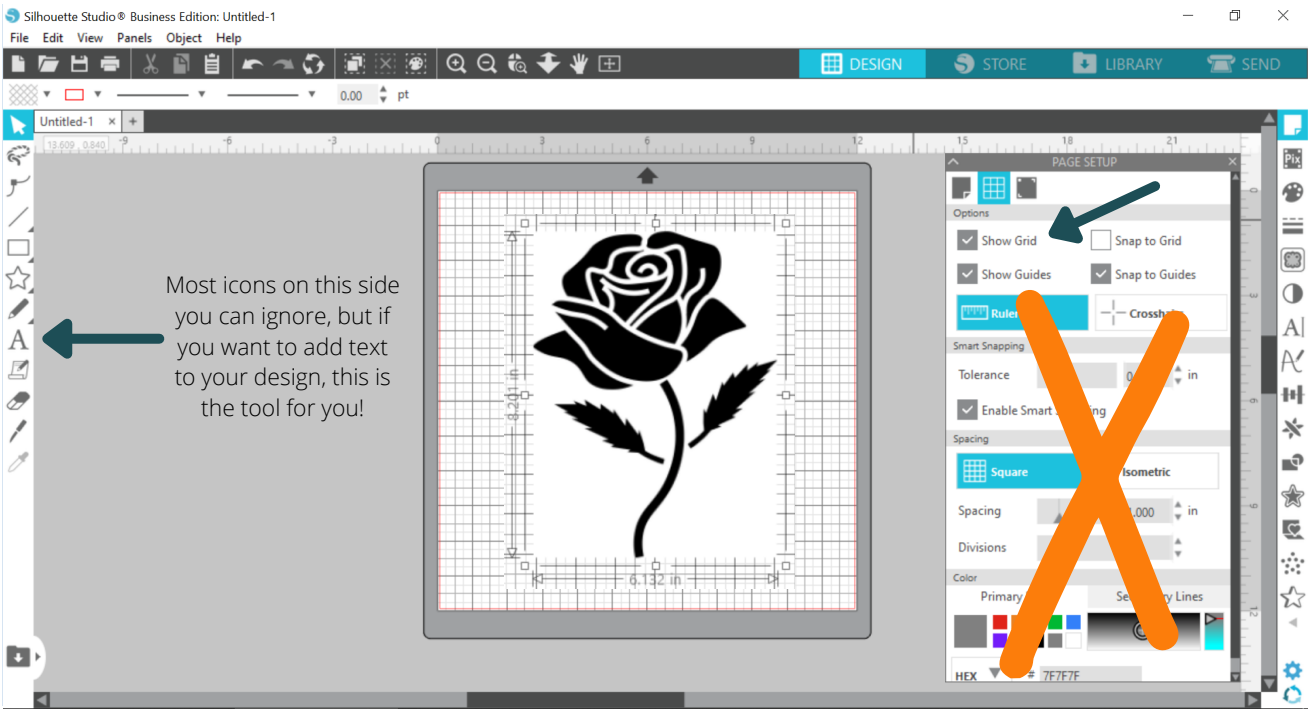
If you aren't sure, it's best to do a little research or play it safe and find another material you know will work. It's also good to have a test piece and never use something valuable on your first attempt.

The library does have some materials you can use for a $5 fee to cover costs.

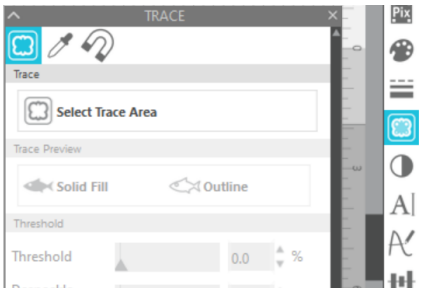
Creating in Silhouette Studio!

Find the image file you would like to work on that drag the icon on top of the Silhouette Studio icon (shown above). This is the simplest way to open the program with your file already loaded.

Silhouette Studio is actually a multiuse program - we also use it for cutting with our Silhouette Cameo vinyl cutter. The reason we like to use it with the Glowforge is that it has the ability to export a file in SVG format. This means that you can isolate separate components of your image and code them so that the Glowforge will engrave one and cut another without you needing to import two separate images to the Glowforge app and arrange them manually. Silhouette Studio also has a user-friendly workspace with simple drag-and-drop editing.

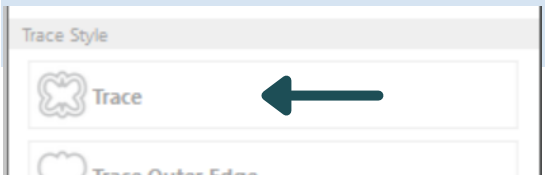


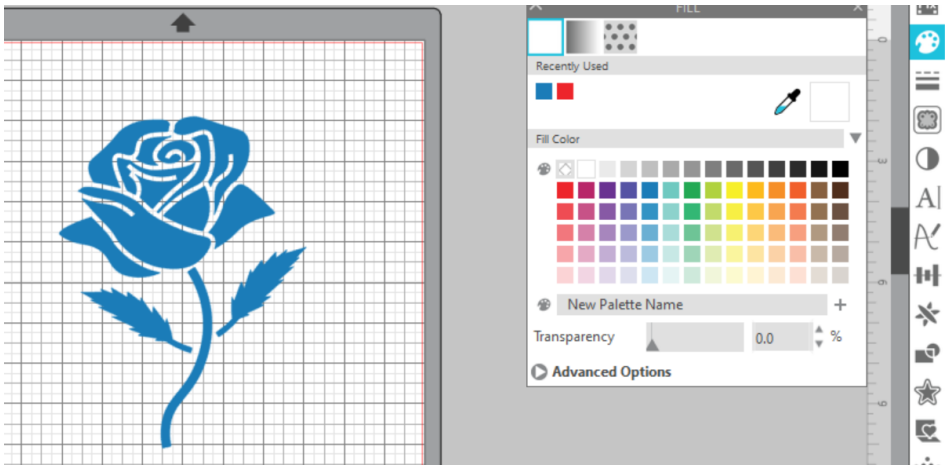
It will open looking like this - we will be using the menus on the right hand side of the screen for the most part. To start, you can toggle the grid on and off in this menu, but most of the other specifications you can ignore - these are specific to the vinyl cutter.



Next, you want to trace the image. To do this, click on this icon on the right hand side, bringing up a new menu.

When you click "Select Trace Area" it will wait for you to left click and drag a selection around the image or even the portion of the image you would like the program to trace. It will highlight in yellow the image it had detected. When you are happy with it, click the menu's "Trace" button.



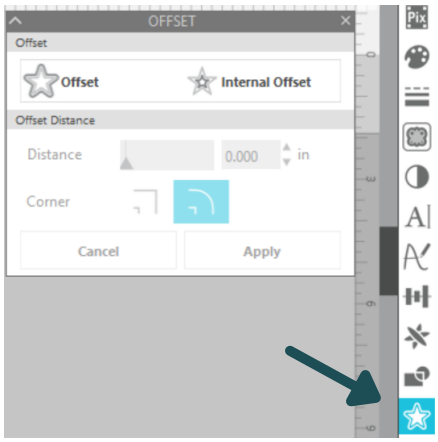


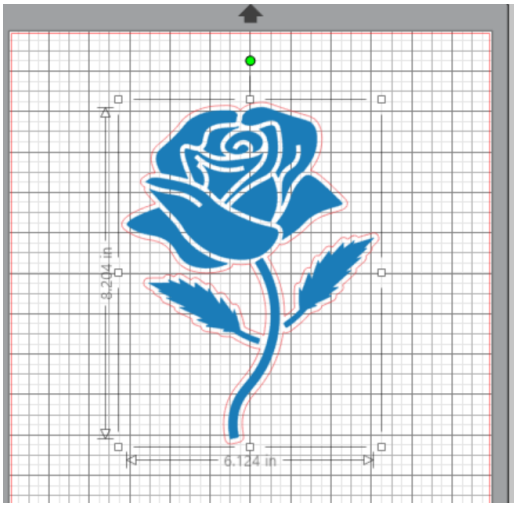
At this point you have what is called a "path" that can be converted to an SVG and you're good to go! If all you want is the line art to be engraved or scored onto your project, you can skip to saving your file as an SVG.

But let's get a little fancier! By choosing the paint palette icon and picking a solid color you can create a filled in shape that the Glowforge will engrave (this sort of engraving will take a little longer).

Now if you want the Glowforge to engrave your image and then cut it out of your material to create something like a coaster, keychain or charm, you want to create another path *around* your design - called an offset.

Find that in the star icon further down on the right hand side. In the new menu that pops up, choose "Offset". After that, you can adjust the size of the offset if you like.



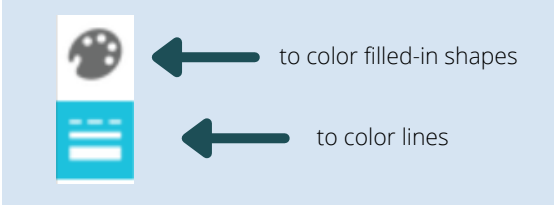


You will have something that looks like this!

The trick to a good SVG to send to the Glowforge is to make sure you have all of the "actions" you want the engraver to take color coded.

So for example here, we want the image to be fully engraved and we've colored that blue. Then we want the Glowforge to cut it out and we have colored that line - the offset - in red.

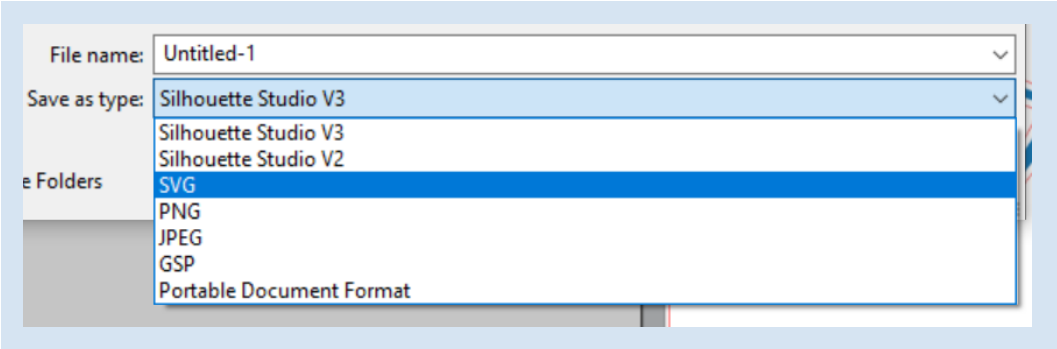
You can play with line colors and fill colors in the line and color palette menus respectively.



Now to save it as an SVG...

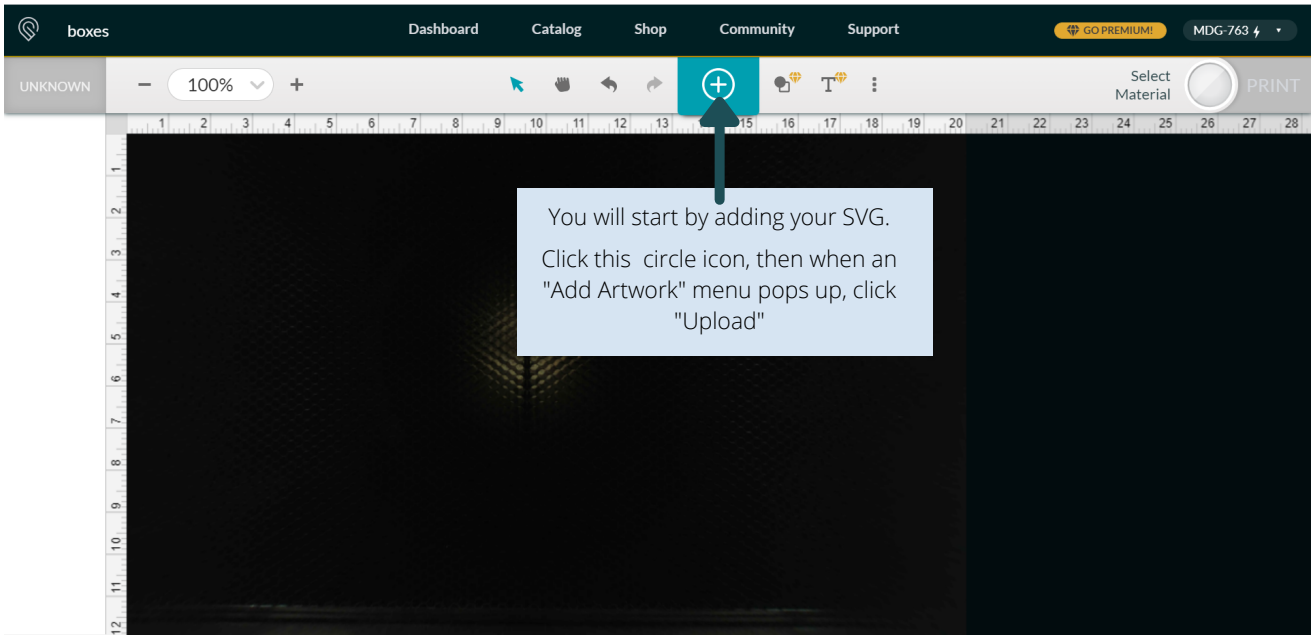
When your design is finished, go to the File menu on the top of the screen in Silhouette Studio, choose "Save As" and then "Save to Hard Drive". Choose the "Desktop" on theleft side of the window that pops up and give your file a name.

In the field where it says "Save as type" below the file name, you want to click to open the drop-down and choose "SVG". This way, the Glowforge app will keep all of the color-coded instructions you made for it!



...and send it to the Glowforge app!

For our purposes, the Glowforge app should already be open and ready to go for your session - so all you need to do is maximize the Google Chrome window. It will look like this:

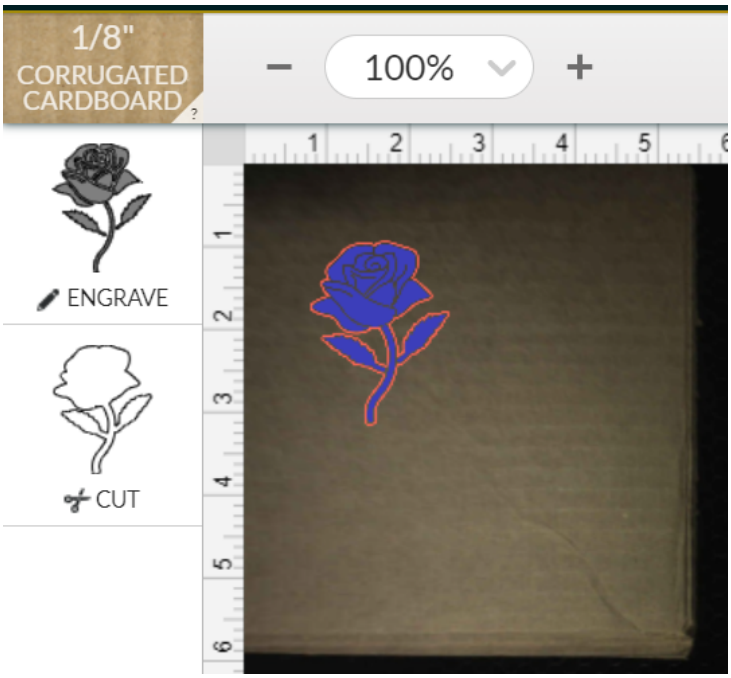


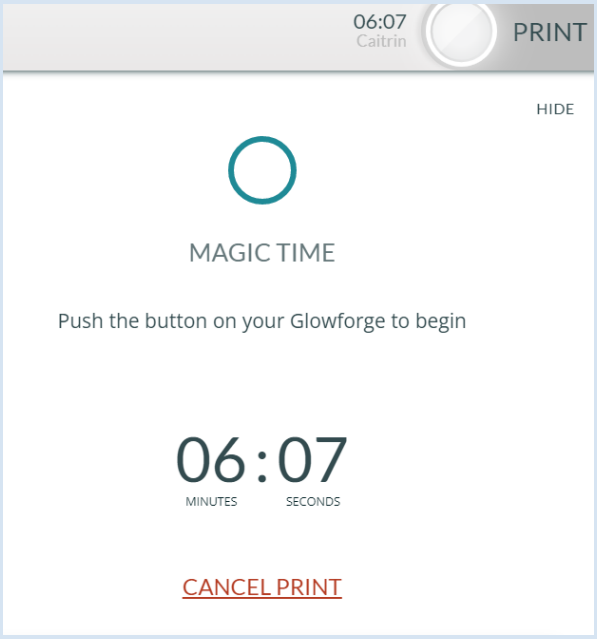
Place your material into the Glowforge now and allow the preview to update so that you can see how your material is aligned inside the Glowforge and can place your design appropriately.

Choose your selected material here (or as close as you can get to it). It is important to know the depth of your material, so we will have our digital caliper available.

Each section of your SVG file will show up as its own tile. Click each tile to choose what you want the Glowforge to do on that certain section. Here we've chosen "Engrave" for the solid blue section...

...and "Cut" for the offset red line





When you are happy with how your design looks in the preview, go ahead and click the "Print" button in the right corner of the workspace.

It will open a dropdown that shows the estimated time and tells you when you can go ahead and press that shiny Glowforge button (which is very satisfying).

Make sure that no matter what material you are engraving or cutting, that the Glowforge's air filter is running throughout the process!